

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date
17 March 2005 (17.03.2005)

PCT

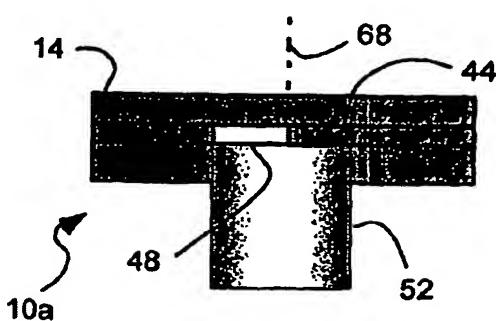
(10) International Publication Number
WO 2005/024230 A2

- (51) International Patent Classification:
F04B
- (21) International Application Number:
PCT/US2004/028890
- (22) International Filing Date:
3 September 2004 (03.09.2004)
- (25) Filing Language:
English
- (26) Publication Language:
English
- (30) Priority Data:
60/500,041 4 September 2003 (04.09.2003) US
60/500,208 4 September 2003 (04.09.2003) US
- (71) Applicant (for all designated States except US): UNIVERSITY OF UTAH RESEARCH FOUNDATION [US/US]; 615 Arapene Drive, Suite 310, Salt Lake City, UT 84108 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): BLANCHARD, Danny [US/US]; 194 West 1450 North, Bountiful, UT 84010 (US). LIGRANI, Phil [US/US]; 3051 East Dimpie Dell Circle, Sandy, UT 84092 (US). GALE, Bruce [US/US]; 4909 Brown Villa Cove, Taylorsville, UT 84123 (US).
- (74) Agents: HOBSON, GARRON, M. et al.; Thorpe North & Western LLP, P.O. Box 1219, Sandy, UT 84091-1219 (US).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Declaration under Rule 4.17:**
— of inventorship (Rule 4.17(iv)) for US only
- Published:**
— without international search report and to be republished upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

WO 2005/024230 A2

(54) Title: ROTARY CENTRIFUGAL AND VISCOSUM PUMPS



(57) **Abstract:** A pump device (10a, 10b, 10c) includes means for both transferring rotational momentum to the fluid by viscous forces, and imparting centrifugal forces to the fluid. The pump (10a, 10b) can include a wiper (44) extending partially across at least one rotatable disc surface (48, 48b, 48c) of at least one rotatable disc (52, 52b, 52c). The pump (10c) can include a rotatable shaft (150) with a hollow cavity (154) extending from one end to at least one slot (158) extending radially from the hollow cavity.